AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application. Please amend claim 1 as follows:

LISTING OF CLAIMS:

1. (Currently Amended) A simulator for a chemical mechanical polishing process for planarizing a semiconductor substrate, said simulator ~~receiving~~ comprising:

a pattern density receiving device receiving pattern density data ~~containing information about a pattern density~~ per unit region of ~~a fabrication pattern in a pattern forming process of~~ a semiconductor device;

height distribution receiving device receiving first and second measured data about height distributions ~~of irregularities~~ on said semiconductor substrate that are measured before and after a chemical mechanical polishing process ~~executed with respect to said pattern forming process,~~;

~~wherein said first measured data is compared with a first calculated data about a two-dimensional distribution of irregularities on said semiconductor substrate before said chemical mechanical polishing process which is calculated from said pattern density data, a least squares analysis is performed to obtain a first correlation coefficient, and a parameter fitting is performed such that square of said first correlation coefficient becomes a maximum, and~~

~~said second measured data is compared with a second calculation data about a two-dimensional distribution of irregularities on said semiconductor substrate after said chemical mechanical polishing process which is calculated from said pattern~~

~~density data, a least squares analysis is performed to obtain a second correlation coefficient, and a parameter fitting is performed such that square of said second correlation coefficient becomes a maximum;~~

a <u>two-dimensional</u> pattern density ~~two-dimensional~~ distribution calculating part that receives said pattern density data, expands said pattern density data in two dimensions based on a coordinate data, and outputs it as a <u>two-dimensional</u> pattern density ~~two-dimensional~~ distribution image ;

a first height distribution calculating part that obtains said first calculated data by executing an operation of multiplying a pattern density at individual parts of said <u>two dimensional</u> pattern density ~~two-dimensional~~ distribution image by a thickness of a laminated film laminated on said <u>two-dimensional</u> pattern density ~~two-dimensional~~ distribution image;

a Fourier calculating part that performs a Fourier transform of said <u>two-dimensional</u> pattern density ~~two-dimensional~~ distribution image and outputs a two-dimensional Fourier image;

a spatial filter part that subjects said two-dimensional Fourier image to a spatial filter such that only a component having a predetermined spatial frequency passes through;

a reverse Fourier calculating part that subjects said two-dimensional Fourier image after being subjected to said spatial filter to a reverse Fourier transform and outputs a two-dimensional reverse Fourier image ; [[and]]

a height distribution calculating part that obtains said second calculated data by executing an operation of multiplying a pattern density at individual parts of

said two-dimensional reverse Fourier image by said thickness of said laminated film

laminated on said two-dimensional reverse Fourier image; and

wherein said first measured data is compared with a first calculated data

about a two-dimensional height distribution on said semiconductor substrate before

said chemical mechanical polishing process which is calculated from said pattern

density data, a least squares analysis is performed to obtain a first correlation

coefficient, and a parameter fitting is performed such that square of said first

correlation coefficient becomes a maximum, and

said second measured data is compared with a second calculation data about

a two-dimensional distribution on said semiconductor substrate after said chemical

mechanical polishing process which is calculated from said pattern density data, a

least squares analysis is performed to obtain a second correlation coefficient, and a

parameter fitting is performed such that square of said second correlation coefficient

becomes a maximum.

2. (Cancelled)

3. (Previously Presented) The simulator according to claim 1, further

comprising:

a mesh adjusting part for sampling meshes of said first and second measured

data so as to match the mesh of said pattern density two-dimensional distribution

image.

4. (Previously Presented) The simulator according to claim 1, further receiving:

a third measured data about a height distribution of irregularities of an under laid layer of said fabrication pattern which is measured before forming said fabrication pattern, and further comprising:

first and second measured data adding parts that add said third measured data to said first and second calculated data, respectively.

5. (Original) The simulator according to claim 4 further comprising:

a mesh adjusting part for sampling meshes of said first, second and third measured data so as to match said mesh of said pattern density two-dimensional distribution image.

6. (Original) The simulator according to claim 1 comprising:

a pattern density two-dimensional distribution calculating part that receives said pattern density data, expands it in two dimensions based on a coordinate data, and outputs it as a pattern density two-dimensional distribution image ;

a height distribution calculating part that obtains said first calculated data by executing n operation of multiplying a pattern density at individual parts of said pattern density two-dimensional image by a thickness of a laminated film laminated on said pattern density two-dimensional distribution image; and

a CMP image calculating part that obtains said second calculated data by (i) calculating, based on said first calculated data, a two-dimensional distribution image of a polishing pad in a state that said polishing pad used in said chemical

mechanical polishing process of said laminated film is pressed against said laminated film, (ii) calculating a two-dimensional distribution image of stress exerted on said polishing pad based on said two-dimensional distribution image of said polishing pad, and (iii) calculating a two-dimensional distribution image of irregularities after polishing said laminated film based on said two-dimensional distribution of said stress.

7. (Original) The simulator according to claim 6, further receiving:

a third measured data about a height distribution of irregularities of an under laid layer of said fabrication pattern which is measured before forming said fabrication pattern, and further comprising:

a measured data adding part that adds said third measured data to said first calculated data.

8. (Original) The simulator according to claim 6 further comprising:

a mesh adjusting part for sampling meshes of said first and second measured data so as to match said mesh of said pattern density two-dimensional distribution image.

9. (Original) The simulator according to claim 7 further comprising:

a mesh adjusting part for sampling meshes of said first, second and third measured data so as to match said mesh of said pattern density two-dimensional distribution image.